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HOSE/UMBILICAL CUTTER HCV155

PRODUCT CODE No. 980217

**INSTRUCTIONS FOR INSTALLATION,
OPERATION & MAINTENANCE**

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Description

The HCV155 is a double acting tool primarily intended for use on umbilical cable and hose and will cut up to 155mm diameter. It may be used on alternative materials, such as electrical power or communication cables, again up to a maximum of 155mm diameter. Where small diameters are to be cut, every effort should be made to place the material centrally along the anvil to minimize offset loading. The cutter is not designed to cut wire rope.

1. **SAFETY**

Before operation, read and understand this operations manual.

Whilst the tool is intended for remote or local operation sub-sea, there is no reason why it should not be used above surface.

Ensure that the tool, hoses and pump are in good condition and properly connected.

Ensure that suitable pressure regulation equipment is used and that the unit is not subjected to pressures higher than those stated in section 3

In all cases, where an operator is present, the safety aspects must be reviewed before the cutting operation is commenced.

No attempt should be made to cut any material that is under tension.

Ensure that the operator is shielded from the cutting blade during the cutting operation.

When cutting near the very end of hose or rope, individual cut wires can be expelled from the tool, please ensure that the operator is shielded from these.

If in doubt please contact the manufacturer (Allspeeds Ltd) or an authorized distributor for assistance.

If at any time it is necessary to carry out proof tests on the tool, e.g. after service on the hydraulic cylinders, it must be returned to the supplier for testing where the following procedures apply.

The maximum proof test pressure should not exceed 125% of the maximum working pressure and this should only be done by Allspeeds using our specially adapted test rig.

The tool should be guarded during the proof test operation, and be carried out in a safe working environment.

The proof pressure should be applied gradually, until the maximum pressure is reached.

INSPECT THE TOOL BEFORE USE

With the cutter isolated from the hydraulic supply, check the condition of the blade edge. If the blade is damaged or blunt replace with a fresh blade before cutting. This procedure is as described in section 8.

Ensure that care is taken when checking the blade as the edge may be sharp

Check the condition of the anvil. It is normal that the anvil will show an indent where the blade has pressed down into it and can withstand multiple cuts, but any excessively damaged anvil should be replaced. This procedure is as described in section 7

Ensure that all retaining bolts are tight

CAUTION – USE OF BLADES AND PARTS NOT APPROVED BY WEBTOOL MAY RESULT IN TOOL FAILURE AND CONSEQUENTIAL DAMAGE

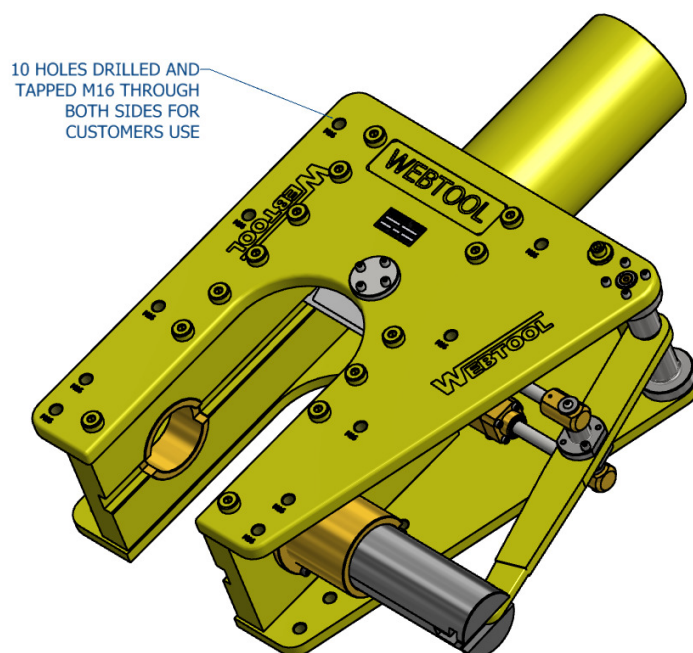
2. CUTTING CAPACITY

The HCV155 is a double acting tool primarily intended for use on umbilical cable and hose and will cut up to 155mm diameter. It may be used on alternative materials, such as electrical power or communication cables, again up to a maximum of 155mm diameter. Where small diameters are to be cut, every effort should be made to place the material centrally along the anvil to minimize offset loading. The cutter is not designed to cut wire rope.

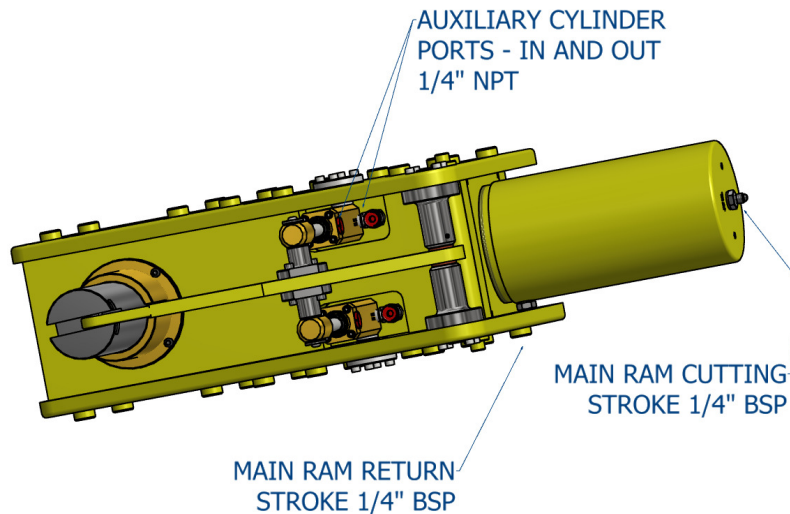
If it is required to extend the range of the cutter, for instance to cut solid bar members of steel, please refer to the manufacturer (Allspeeds Ltd) with full details of size and tensile strength. Failure to do so may result in damage to the anvil and blade.

3. INSTALLATION

Ten tapped Holes, M16 through, are provided in the tool body (see sketch) which can be used for any attachment necessary to mount the cutter. The cylinder is a pressure vessel and is not recommended as a mounting point, the cylinder should not be drilled, machined, mutilated or damaged in any way, any warranty could be invalidated by such actions.



Two hydraulic supplies are required, ported as shown below. The maximum working pressures are shown in the table 1 below and pressure limiting valves must be fitted into the supply to limit the pressures to these levels.



A relief valve should also be incorporated in the return line. This is to prevent excessively high pressures in the annular side of the hydraulic cylinders should the return to tank become blocked for any reason.

The oil supply must be clear and free from contamination. A good quality ISO32 grade hydraulic oil, e.g. Shell Tellus 32 or equivalent, is suitable.

The weight of the tool is 165Kg.

TABLE 1.

Function	Working Pressure		Swept Volume	
	psi	bar	ml.	U.S. Gallon
Working Stroke	10,000	690	1670	(0.44)
Return Stroke	2,750	190	760	(0.20)
Auxillary Stroke - retract	2,750	190	86	(0.023)
Auxiliary Stroke – reset	2,750	190	53	(0.014)

4. OPERATION

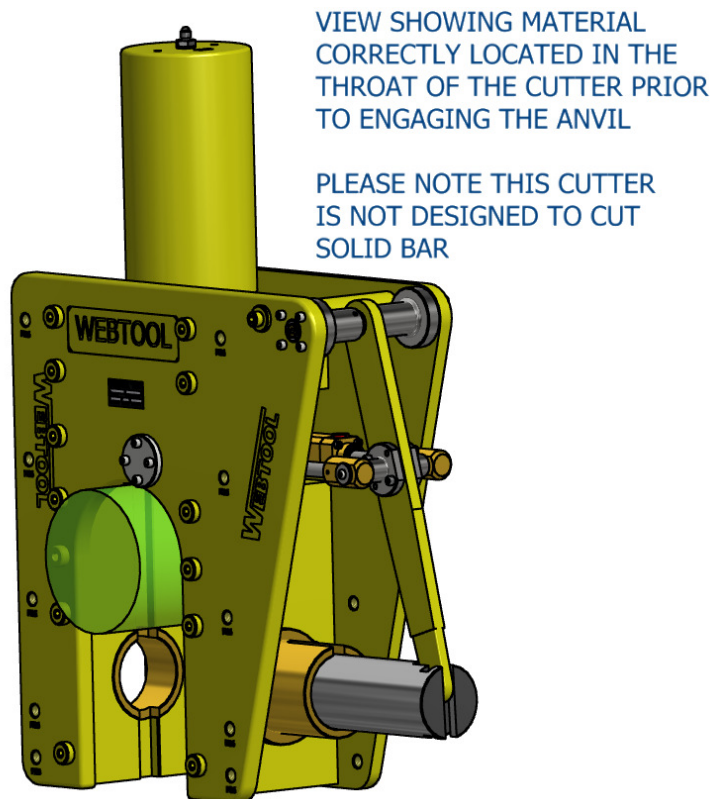
Before deployment, function test the tool and ensure that all operators are familiar with this procedure. ROV observation of the tool should be maintained at all time during operation. Prior to use, ensure no damage has occurred to the blade or anvil. Ensure the anvil is fully retracted.

Important: Please note this tool is designed for intermittent subsea use. Please refer to the manufacturer (Allspeeds Ltd) or an authorized distributor should you wish to use this tool subsea for any period over 14 days.

CAUTION – Any modification made to this tool will invalidate the warranty and may lead to equipment failure or personal injury. If in doubt please contact the manufacturer (Allspeeds Ltd) or an authorised distributor for assistance.

DEPLOYMENT

Place the cutter over the wire rope. Ensure that the wire rope is as far into the cutter as possible.



Pressurize the auxiliary cylinders to fully extend the anvil, thus retaining the material in the body of the tool. Check visually that the anvil is fully home, this is important to prevent damage to the tool.

Operate the main ram power port to sever the material, hold pressure until the material is severed.

N.B. Do not operate the auxiliary cylinders when the main ram is fully extended since this would damage the anvil.

Please note that this tool has a relief valve fitted which will blow off at approx. 750 bar, DO NOT leave the pressure on so that the relief valve is continually blowing off.

Once the material is severed, pressurize the main ram retract port to withdraw the cutting blade. Then, and only then, retract the anvil. It is important not to operate the auxiliary cylinders whilst the main ram and blade are in the fully extended position.

If a further cut is required, the above procedure should be repeated.

TROUBLESHOOTING

If the material does not cut through completely on the first attempt, cycle the blade by retracting it slightly and then attempting the cut again.

If the material does not completely cut after multiple cycles of the blade, check the input pressure to the main input of the cylinder. This can be a maximum of 690 bar (10,000psi). If the material to be cut is still not severed after multiple cycles and at a pressure of 690 bar, retract the blade and then the anvil and return the tool to the surface for inspection of the blade and anvil, replace if necessary.

IMPORTANT NOTE – ENSURE THAT THE BLADE IS FULLY RETRACTED AND THAT ALL PRESSURE TO THE CUTTER IS RELIEVED AS IT IS RAISED TO THE SURFACE. FAILURE TO DO THIS CAN LEAD TO A DANGEROUS BUILD UP OF PRESSURE IN THE CYLINDER.

5. AFTER USE

When the tool is retrieved from a marine environment, it should be hosed off with clean water, allowed to drain and sprayed externally with a de-watering fluid. Before storage, inspect the general condition of the tool. Particular attention should be paid to the anvil and blade. The anvil should be clean and free from any damage or bruising on the outside diameter that would prevent it from retracting properly, The blade edge should be smooth and free from any serrations. Note that a slight ripple to the blade edge is acceptable and will not cause problems. Any minor damage can be smoothed off with an oil stone if necessary.

IMPORTANT – DO NOT STORE THE TOOL WITH A COMPLETELY SEALED CYLINDER AS PRESSURE MAY BUILD UP DUE TO TEMPERATURE CHANGES.

6. SERVICE

IMPORTANT – ENSURE THERE IS NO HYDRAULIC PRESSURE IN THE CYLINDER BEFORE PERFORMING ANY SERVICE OR MAINTENANCE PROCEDURES ON THIS CUTTER

It is unlikely that service would be required on the hydraulic components of the tool under normal circumstances, but a seal spares kit is available if required. The only parts that would need intermittent replacement would be the anvil and blade, depending on the frequency of use and materials being cut. These parts can be ordered up on the following spares reference numbers, but in addition please quote the tool serial number.

HCV155 seal kit, cutter and auxiliaries	Part Number	995285	
Seal Kit auxiliary cylinder only	Part Number	995122	
Anvil	Part Number	SSC6489	
Blade	Part Number	705051c	
Blade Retaining Pin	Part Number	030636	2 off

We advise that any servicing should be carried out by an authorised distributor only. If required, the tool can be returned to the manufacturer for servicing and testing.

If servicing is to be undertaken by the user, please see note on proof testing under SAFETY (Section 1), and the following:-

All servicing operations should be carried out in a clean environment to prevent contamination of the oil and mating components.

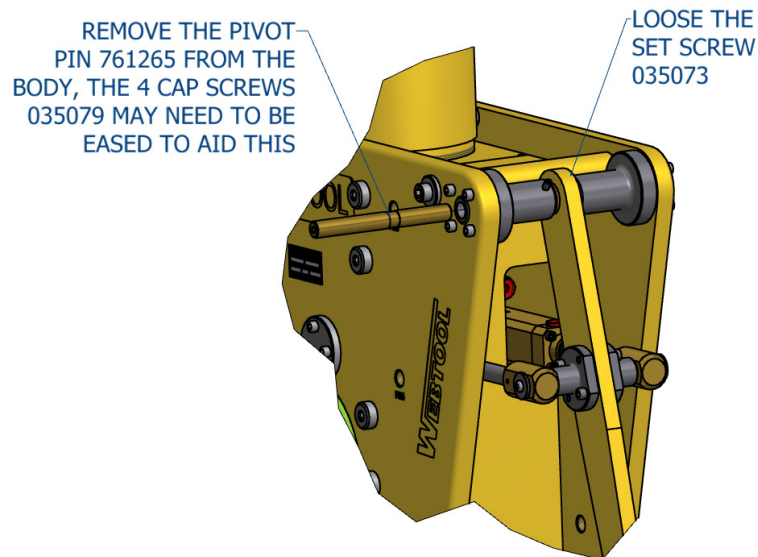
Care should be taken with all mating areas ie. threads and sealing faces, as any damage or abrasive contamination could cause galling or seizing on re-assembly.

The cylinder is a pressure vessel and should not be drilled, machined, mutilated or damaged in any way for mounting purposes or to assist in its removal for servicing, any warranty could be invalidated by such actions. Also see section 9

The use of stilsons to remove the cylinder is not recommended as damage will occur.

7. REPLACEMENT OF THE ANVIL

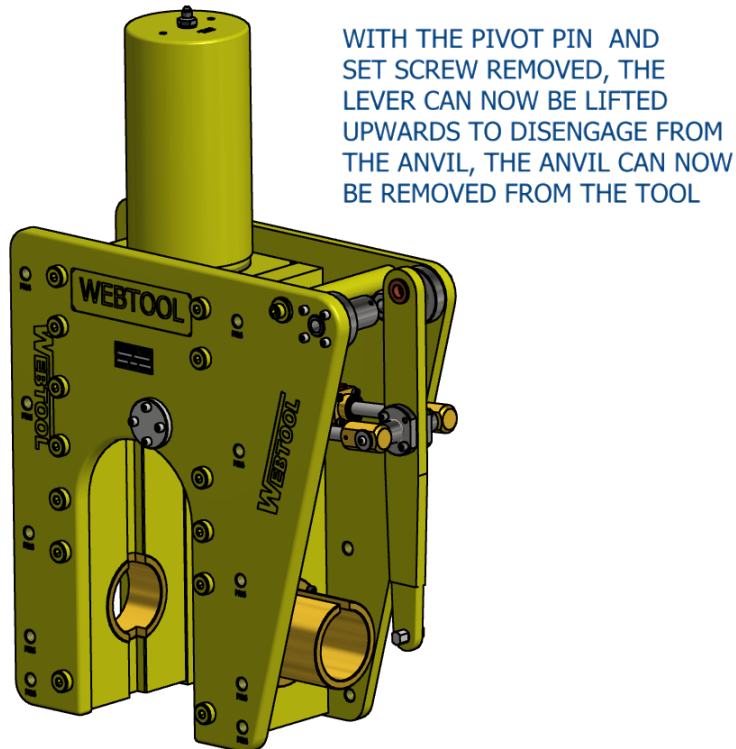
Loosen the four screws 035079 and the set screw 035073. Attached a screw to the Pivot Pin 761265 and pull free.



The lever will now be free, lift it free from the anvil SSC6489

The anvil SSC6489 may now be removed from the body.

Re-assembly is the reverse of the above process.



8. REPLACEMENT OF THE CUTTING BLADE

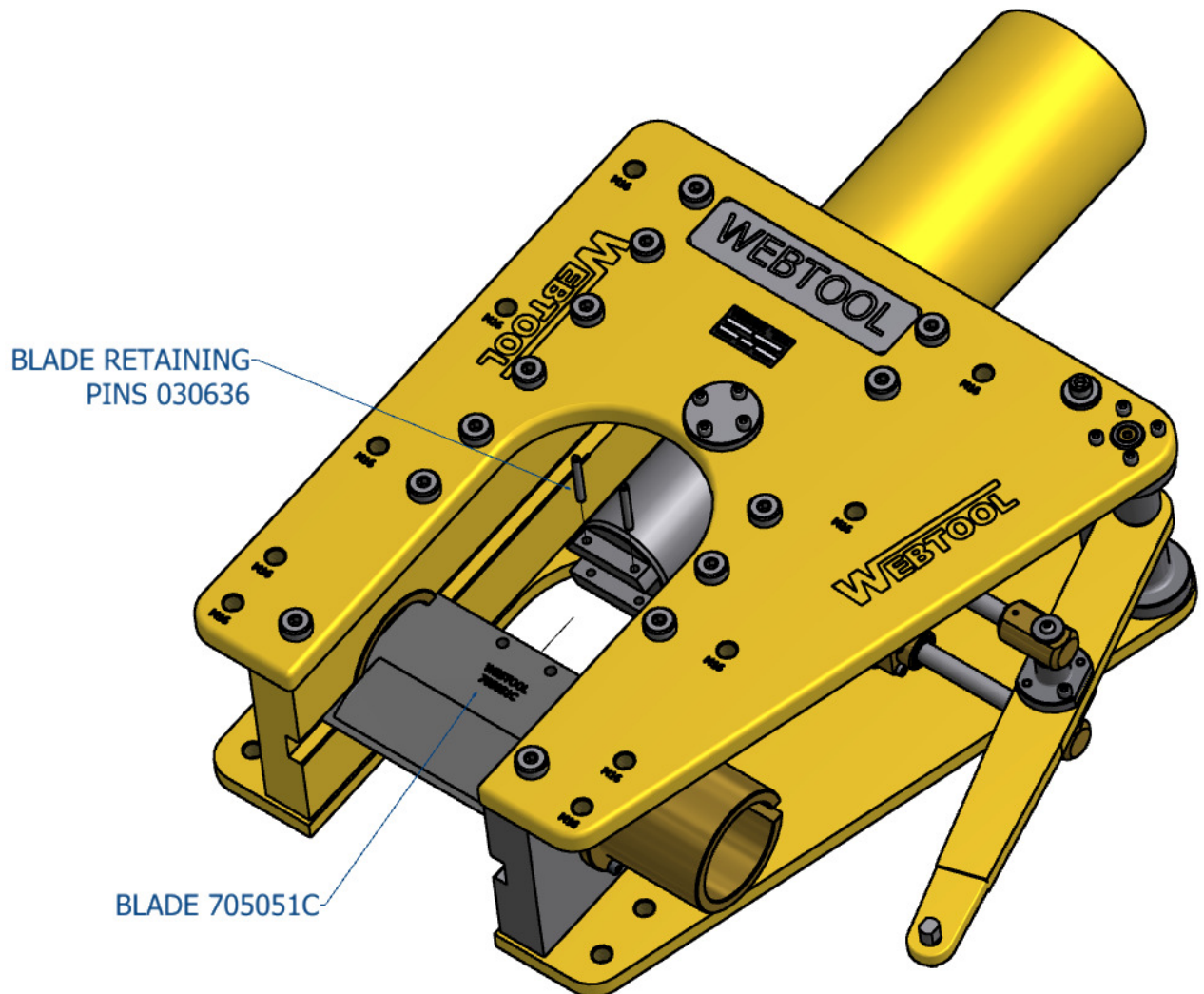
First withdraw the anvil as described above.

Pump out the main ram until the blade retaining pins 030636 can be seen in the opening of the cutter body.

Drift out the pins 030636 and slide the blade 705051C out of the tool.

Gloves may be worn to protect the hands when removing the blade from the tool

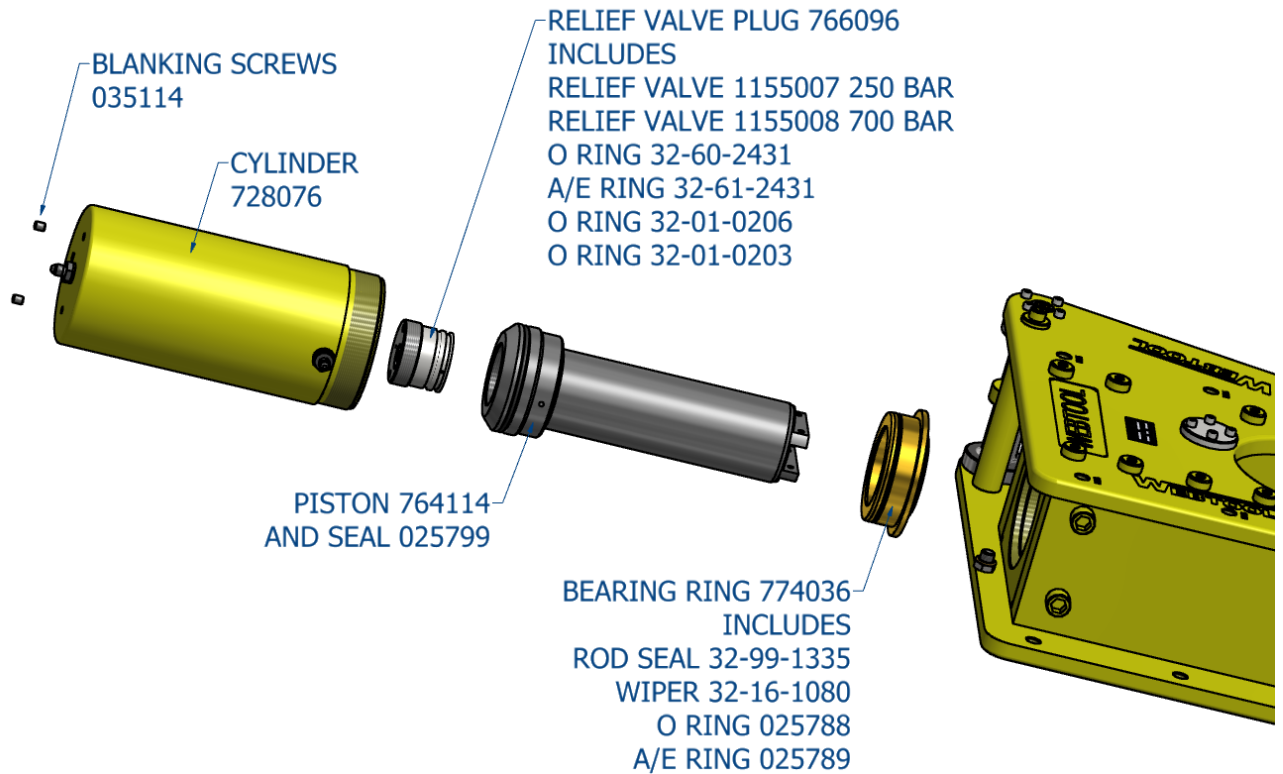
When refitting the new blade ensure the retaining pins are below the surface of the ram on both sides.



9. REMOVAL OF THE MAIN CYLINDER

If it is necessary to renew the hydraulic seals, first remove the blade as described above in section 8, the cylinder must then be removed from the tool. As an aid to this, remove the 2 blanking screws 035114, then a bar is to be fastened to the top of the cylinder using the 2 tapped holes, apply a torque and not a bending moment when unscrewing the cylinder. The

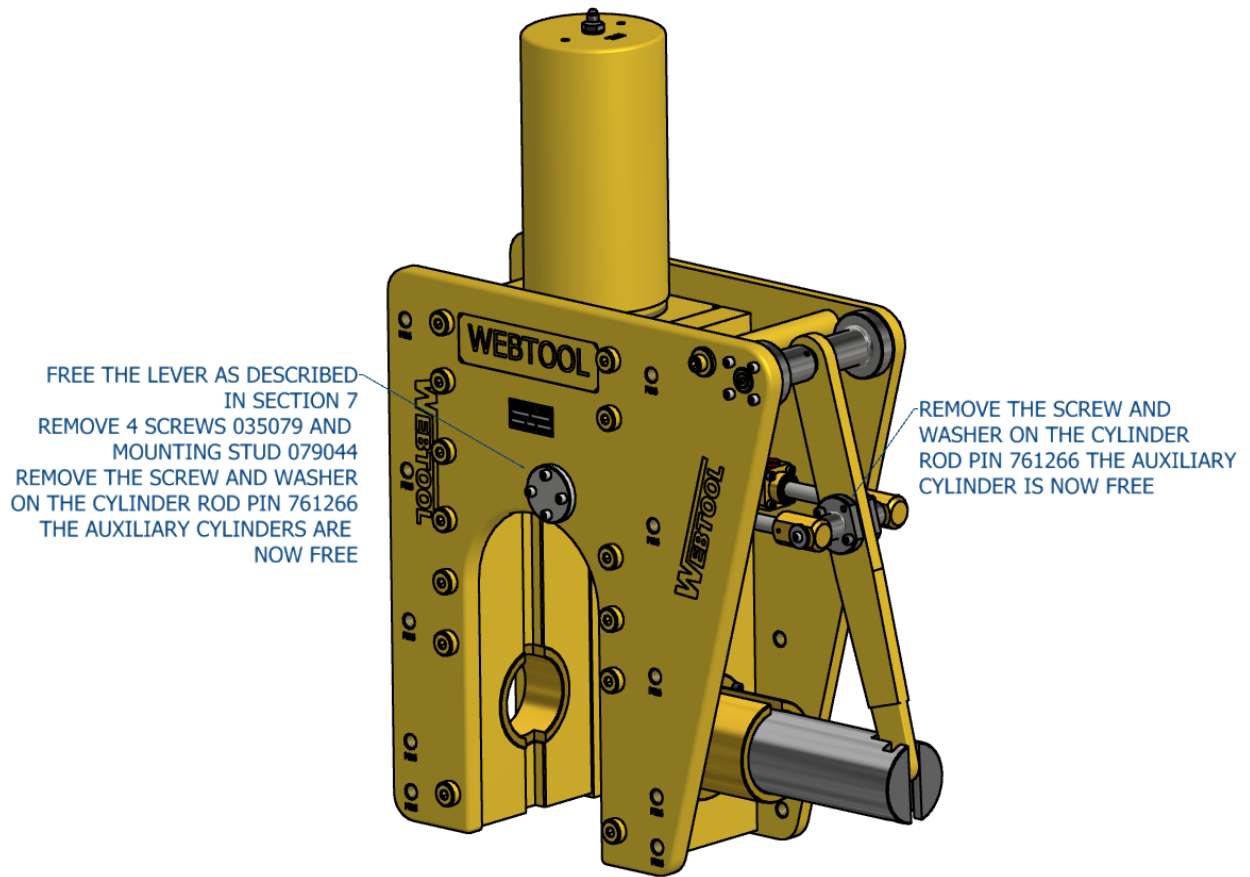
cylinder is a pressure vessel and should not be drilled, machined, mutilated or damaged in any way for mounting purposes or to assist in its removal for servicing, any warranty could be invalidated by such actions. Do not use Stilsons to remove the cylinder as damage will occur. A cylinder assembly tool is available as an optional extra part number SK4377A



Removing the cylinder will expose the ram, bearing ring and relief valve plug and allow access to all the seals, note the positions of the relief valves and ensure they are replaced in the correct positions.

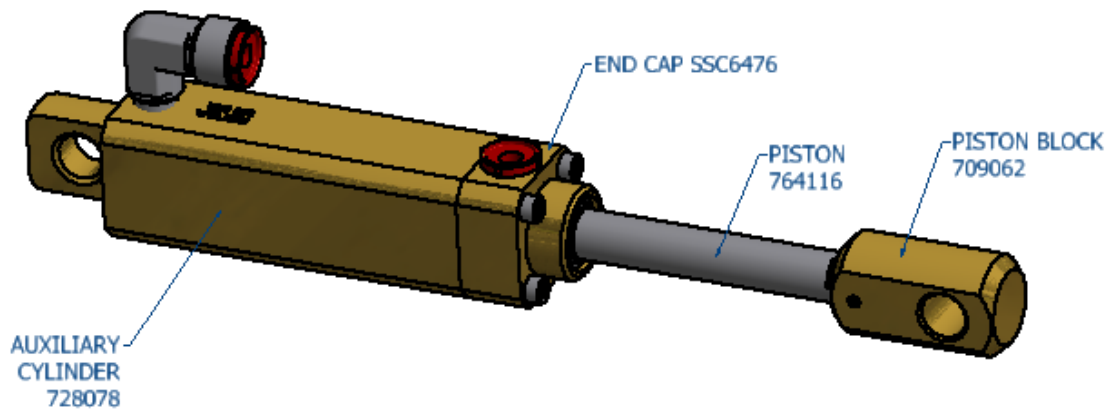
10. REMOVAL OF THE AUXILIARY CYLINDERS

First remove the hoses from the auxiliary cylinders. Free the lever as described in section 7, remove the 4 cap screws 035079 and the mounting stud 079044, the cylinders are now free. Remove the screw and washer from the cylinder rod pin, by pulling the lever away from the body the cylinders will be free.



11. REPLACING AUXILIARY CYLINDER SEALS

Remove the 4 screws 035067 to free the end cap SSC6476, remove the M4 set screw to allow the piston block 709062 to be unscrewed, the piston can now be removed, all seals are now accessible



Cutter Seal Kit – including auxiliary cylinders		995285
Part No.	Description	Qty
025 799	Piston head seal	1
32-99-1335	Rod seal	1
025 789	Anti extrusion ring – cylinder/ram bearing ring	1
025 788	Piston seal – cylinder/ram bearing ring	1
32-16-1080	Wiper	1
025 801 *	Piston seal - Auxiliary cylinder	2
025 802 *	Rod seal – Auxiliary cylinder	2
025 569 *	Ram Wiper – Auxiliary cylinder	2
025 311 *	O Ring – Auxiliary cylinder	2
32-60-2431	O Ring – Relief valve plug	1
32-61-2431	A/E ring for 32-60-2431	1
32-01-0203	O Ring for 1155008	1
32-01-0206	O Ring for 1155007	1

Items marked thus * are in seal kit 995122 replacement seals for one auxiliary cylinder

HCV155 – Part List		980217
Part No.	Description	Qty.
982 130	Cutter body	1
728 076	Cylinder	1
764 114	Ram	1
774 036	Bearing ring	1
705 051c	Blade	1
766 100	Blanking plug	1
SSC6489	Anvil	1
030 636	Blade retaining pin	2
766 096	Relief valve plug	1
1155007	Relief valve 250 bar	1
1155008	Relief valve 700 bar	1
982 132	Auxiliary cylinder assembly	2
715 349	Anvil guide bush	1
715 351	Anvil bush	1
715 345	Pivot pin lever bush	2
761 247	Anvil sliding pin	1
749 044A	Pivot pin housing, left	1
749 044B	Pivot pin housing, right	1
761 265	Lever pivot pin	1
079 044	Auxiliary cylinder mounting stud	2
765 213	Lever	1
761 266	Cylinder rod pin, auxiliary cylinder	2
080 971	Washer	4
035 111	Socket cap screws M6 x 35	4
035 079	Socket cap screw M6 x 25	16
035 066	Socket cap screw M6 x 20	8
035 076	Socket button head screw M6 x 10	5

035 073	Socket set screw M6 x 10	1
035 114	Socket set screw M8 x 10, cylinder blanking	2
766 095	Swival blanking cap JIC	2
752 342	Webtool nameplate	1
766 047	Plastic plug	4
791 157	Coupling , 7/16" JIC No.4 – ¼" BSP	2
752 573	Pressure warning label	1
035 119	Socket cap screw M16 x 50 SS for customer mounting	10
31-99-2834	Eye bolt	6

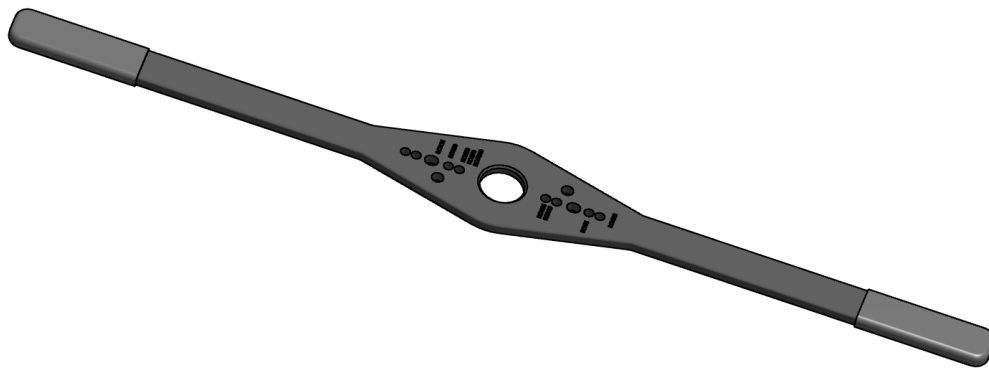
Auxiliary Cylinder parts list (for 1 cylinder)		982132
Part No.	Description	Qty
709 062	Piston block	1
728 078	Lever cylinder	1
SSC 6476	End cap	1
764 116	Piston	1
026 701	Pellet	1
995 122	Seal kit auxiliary cylinder	1
043 206	Piston block screw	1
035 067	End cap screw	4
701 195	Adaptor	1

Completion Kit HCV155		999021
765 338	Manifold block	1
035 134	Intensifier captive screw	4
765 315	Intensifier captive plate	1
769 012	Connectors	2
035 150	Socket cap screws	2
725 005	Stainless steel intensifier	1
020 994	Lock nuts	4
766 086	Filter	2
32-07-0035	Bonded seals	10
32-67-1201	Bonded seals for intensifier	2
791 154	Male to male couplings ¼" BSP	8
791 159	Male to male couplings ¼" NPT to ¼" BSP	2
035 080	Blanking set screws	3
31-47-0310	Balls	3
1241059	Auxiliary hose	2
1241060	Auxiliary hose	2
1241058	Hose – cutting stroke 700 bar	1
1241057	Hose – return stroke 700 bar	1
025 932	A/E ring for seal 025674	2
025 674	O Ring	2
791 157	Male to male coupling ¼"BSP to No. 4 JIC	4

This HCV155 cutter is compatible with the following optional extras, not supplied as standard.

Cylinder Assembly Tool - SK4377A

This tool can be used on RCV75, RCV75HD, RCV115, RCV135, RCV155, RCV190, HCV100, HCV120, HCV250 and HCV270 cutting tools



Webtool Hydraulic Intensifier – HP690A (available in a range on intensification ratios)

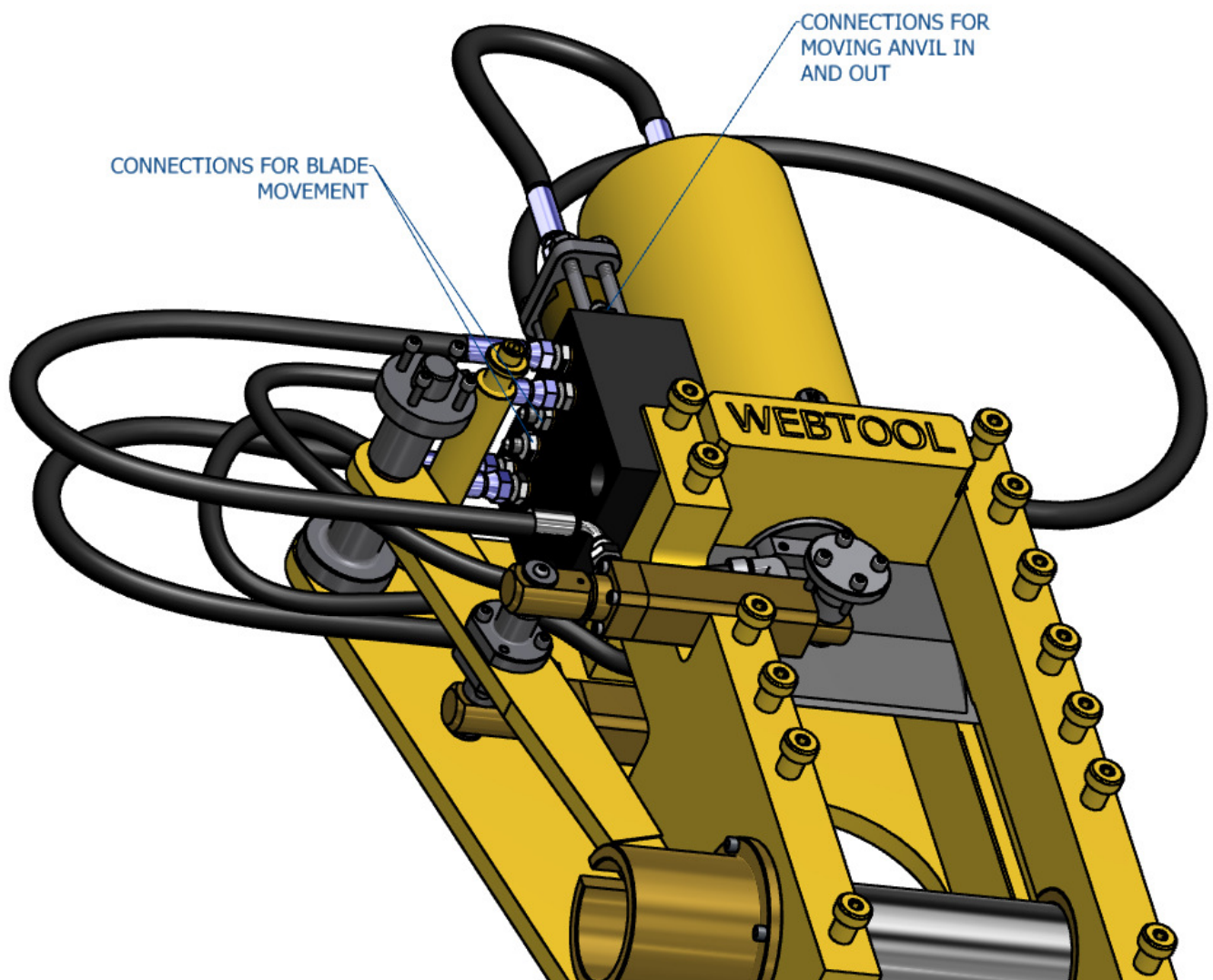


For further information contact the manufacturer (Allspeeds Ltd) or an authorised distributor.

OPTIONAL COMPLETION KIT 999021 FITTED TO HCV155

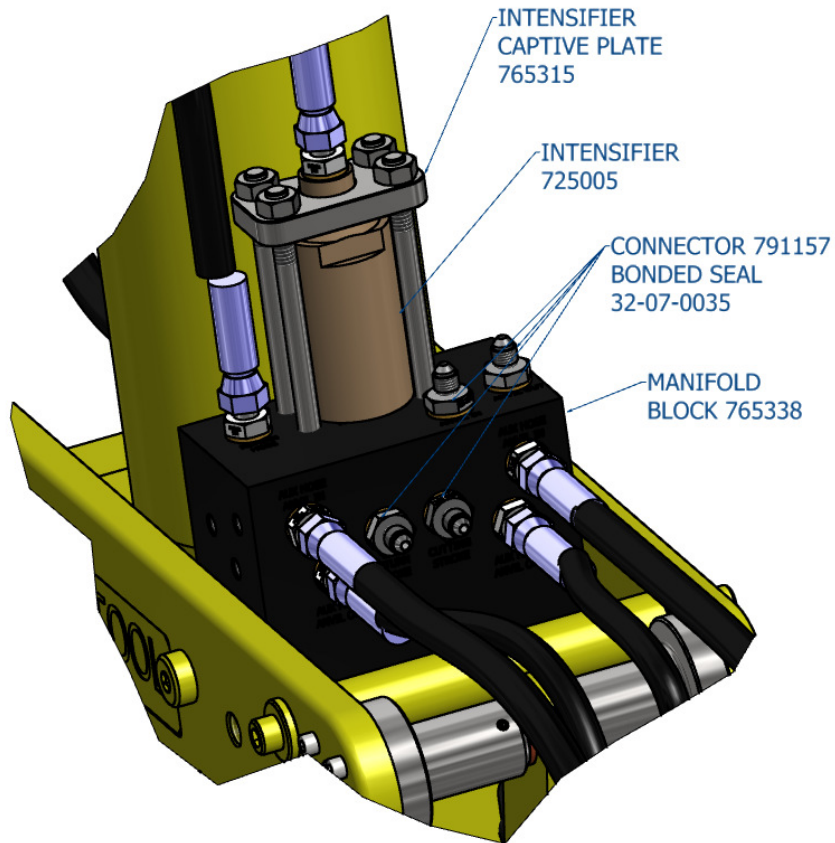
This is a special manifold block unique to the HCV155, fitted with intensifier and hoses, the manifold has two connections for the blade movement on the side and two on the top for activating the anvil in and out. All connections are clearly marked. If the intensifier is removed it is important that it is replaced in exactly the same position, the manifold block is marked with "R" and "IN" this corresponds with the same markings on the bottom of the intensifier. The intensifier has 2 pins in the bottom, each has a seal, to replace the seals remove the 4 nuts holding down the intensifier captive plate, remove the intensifier, the seals are now accessible.

Below is shown the cutter fitted with a completion kit, a side plate has been removed to show more clearly the hose connections

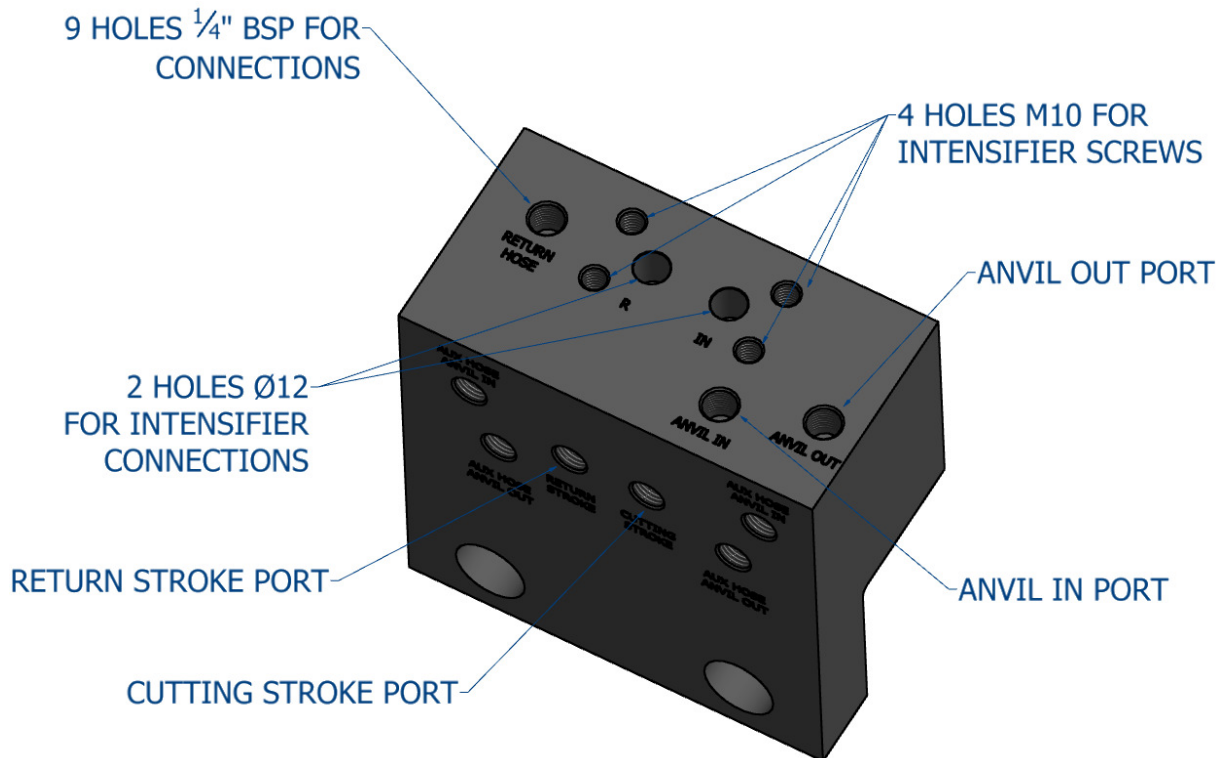


The hoses connected to the main cylinder are rated at 700 bar, those for the auxiliary cylinders are rated at 400 bar.

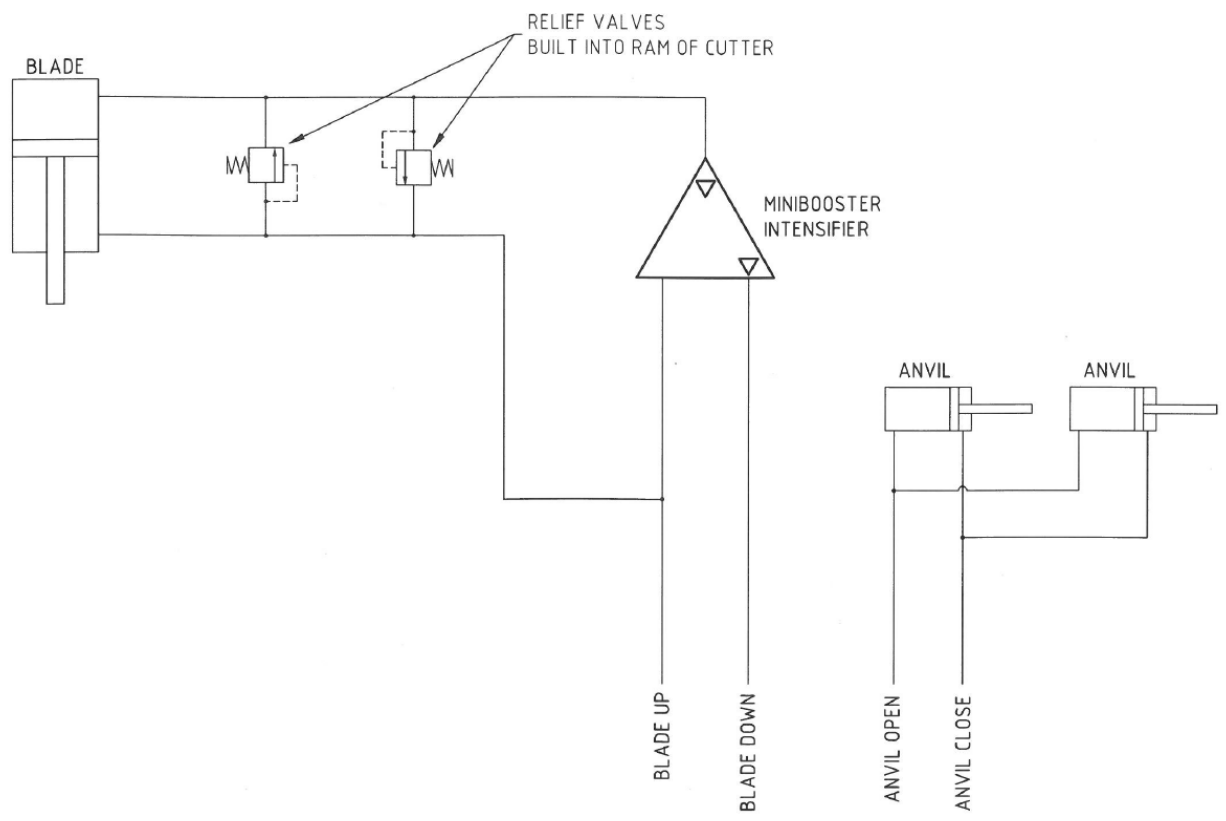
The couplings for the cutting stroke and return stroke are 7/16" JIC all other couplings in the manifold block are 1/4" BSP



Below is shown a close up of the manifold block with hoses and connections removed for clarity, all hydraulic connection points are clearly marked, if any hoses are removed it is very important that they are replaced in the correct position.



Below is a schematic drawing of the hydraulic system for the HCV155





CUTTING EDGE TECHNOLOGY

Webtool specialises in engineering powerful hydraulic tools for cutting and gripping rope, cable and umbilicals.

Models designed for use in subsea environments by ROV's, and surface applications in hostile environments.

- Wire rope cutters (WCS and WCOS) – capable of cutting steel wire rope up to 75mm diameter
- Wire Rope Cutters (RCV) – capable of cutting steel wire rope up to 190mm diameter
- Cable Cutters (HCV) – capable of cutting cable, umbilical and armoured flexible pipe lines up to 330mm diameter
- Softline Cutters (SL) – capable of cutting fibre ropes in various sizes
 - Wire Rope / Cable Grippers
 - Wire Rope Clamps
 - Automatic Shackles

Application specific solutions

Our in house design and manufacturing capability means we can quickly and efficiently develop a solution to suit your particular application. Contact our engineering department to discuss how we can help.

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